

Hydraulic Optimization of Drilling Fluids in Borehole Drilling

Abstract

A method for optimizing drilling fluid hydraulics when drilling a well bore is disclosed. The drilling fluid is supplied by a surface pump through a drill string to a drill bit. The method has the step of adjusting the flow rate of a surface pump and a fluid pressure drop across the drill bit while drilling such that the drilling fluid hydraulics are optimized for a given drilling condition. In order for the flow through all the devices in the drill string to also be optimized, the flow through the devices is adjusted, thereby setting the pressure drop and the fluid flow rate through each device. As required for the overall system, the flow from the surface pump is increased or decreased as necessary.